Aviation Investigation Final Report

Location:	Humboldt, Tennessee	**Accident Number:**	ERA20LA198
Date & Time:	May 29, 2020, 11:30 Local	**Registration:**	N6989P
Aircraft:	Piper PA-24-180	**Aircraft Damage:**	Substantial
Defining Event:	Fuel contamination	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

New avionics had just been installed in the airplane after a 5 week wait, and the purpose of the accident flight was for the pilot to test fly the airplane with the installing mechanic. The pilot performed an uneventful preflight inspection of the airplane and after liftoff there was a reduction in engine rpm before the engine lost power completely. The pilot preformed a forced landing to a golf course, resulting in substantial damage to the fuselage and both wings. No mechanical anomalies were discovered during a postaccident examination of the engine that would have precluded normal operation; however, a fuel sample from the carburetor bowl displayed a cloudy (green/yellow) tint instead of the expected clear, blue coloring of aviation fuel. No other contamination was observed within the airplane's fuel system and the source of the contamination could not be identified. Given this information, it is likely that the engine lost power due to contaminated fuel that migrated through the fuel system into the carburetor.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

A partial loss of engine power due to contaminated fuel.

Findings

Aircraft	Fuel - Fluid condition

Factual Information

History of Flight

Initial climb	Fuel contamination (Defining event)
Initial climb	Off-field or emergency landing

On May 29, 2020, about 1130 central daylight time, a Piper PA-24-180, N6989P, was substantially damaged when it was involved in an accident near Humboldt, Tennessee. The pilot and passenger were not injured. The airplane was operated as a *Title 14 Code of Federal Regulations* Part 91 personal flight.

According to the pilot, the airplane had been at Humboldt Municipal Airport (M53) Humboldt, Tennessee, for about 5 weeks to have new avionics installed in the airplane. The installation was completed on the day prior to the accident flight. The mechanic had also fueled the airplane to a total of 60 gallons that day. The purpose of the accident flight was to test and evaluate the new avionics. After the pilot performed a preflight inspection of the airplane with no anomalies found, he and the mechanic boarded the airplane for the flight. During the taxi and engine run-up, the pilot noted that "all engine parameters were indicating normal." The pilot taxied to runway 22 and briefed the mechanic of his intentions to remain in the traffic pattern. After applying full engine power, he again noted that the engine instruments indicated "normal."

Shortly after lift-off the engine "shuttered and had a sudden reduction in RPM." With the landing gear still down, he pitched the airplane forward, and the engine regained RPM, which brought the nose back up. After clearing over powerlines off the departure end of the runway, the engine backfired, shuttered and experienced a total loss of power. He then set up for a forced landing on a golf course. After touching down, he "applied maximum braking" before the airplane struck a wooden fence, and then a brick pillar and metal pool fence, which resulted in damage to the fuselage and both wings. Both the pilot and passenger egressed the airplane without injury.

The airplane was recovered to a salvage facility and an engine examination was conducted by an airframe and powerplant (A&P) mechanic, with oversight by a Federal Aviation Administration inspector. The engine did not show evidence of impact damage and all components were present. No evidence of any preimpact mechanical malfunctions or failures of the engine were observed during the examination.

A fuel sample was obtained from the carburetor bowl that appeared cloudy with a greenish-yellow tint. A second fuel sample obtained from the fuel supply hose was clear with a blue tint. A third sample obtained from the main gascolator sump was clear with blue tint. The electric fuel boost pump was powered on and functioned normally. The internal filter screen in the electric pump was clean with no debris. The mechanical fuel pump produced suction on the inlet side when the crankshaft was rotated manually via the propeller. The source of the fuel contamination was not determined.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	31,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	February 10, 2020
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 3, 2019
Flight Time:	1593 hours (Total, all aircraft), 667 hours (Total, this make and model), 1474 hours (Pilot In Command, all aircraft), 80 hours (Last 90 days, all aircraft), 18 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Passenger Information

Certificate:		**Age:**	Male
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Lap only
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N6989P
Model/Series:	PA-24-180	**Aircraft Category:**	Airplane
Year of Manufacture:	1960	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-2132
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	July 11, 2019 Annual	**Certified Max Gross Wt.:**	2550 lbs
Time Since Last Inspection:	75 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	5533.5 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	O-360A1A
Registered Owner:	On file	**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	MKL,422 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	11:53 Local	**Direction from Accident Site:**	189°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Overcast / 1800 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots / None	**Turbulence Type Forecast/Actual:**	None /
Wind Direction:	300°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.94 inches Hg	**Temperature/Dew Point:**	22°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Humboldt, TN (M53)	**Type of Flight Plan Filed:**	None
Destination:	Humboldt, TN (M53)	**Type of Clearance:**	None
Departure Time:	11:30 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Humboldt Muni M53	**Runway Surface Type:**	Grass/turf
Airport Elevation:	421 ft msl	**Runway Surface Condition:**	Dry
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	35.793609,-88.878608(est)

Administrative Information

Investigator In Charge (IIC):	Wentz, Peter
Additional Participating Persons:	Bradley J Gottschalk; FAA FSDO; Memphis, TN
Original Publish Date:	June 14, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=101345